

IN THE CLAIMS

Please amend the claims as follows:

- 1 1. (Withdrawn) A method of p-type doping in ZnO comprising:
  - 2 forming an acceptor-doped material having ZnO under reducing conditions,
  - 3 thereby insuring a high donor density; and
  - 4 annealing the specimens of said acceptor-doped material at intermediate
  - 5 temperatures under oxidizing conditions so as to remove intrinsic donors and activate
  - 6 impurity acceptors.
- 1 2. (Withdrawn) The method of claim 1, wherein said reducing conditions comprise a
- 2 hydrogen containing atmosphere.
- 1 3. (Withdrawn) The method of claim 1, wherein said reducing conditions comprise a
- 2 non- hydrogen containing atmosphere.
- 1 4. (Withdrawn) The method of claim 1, wherein said acceptor-doped material comprises
- 2 a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer deposited
- 3 on said n-type ZnO layer.
- 1 5. (Withdrawn) The method of claim 1, wherein said intermediate temperatures
- 2 comprise a temperature range between 200 °C and 700 °C.
- 1 6. (Withdrawn) A method of forming p-n junctions using p-type ZnO comprising:
  - 2 forming an acceptor-doped material having ZnO under reducing conditions,
  - 3 thereby insuring a high donor density; and

4 annealing the specimens of said acceptor-doped material at intermediate  
5 temperatures under oxidizing conditions so as to remove intrinsic donors and activate  
6 impurity acceptors.

1 7. (Withdrawn) The method of claim 6, wherein said reducing conditions comprise a  
2 hydrogen containing atmosphere.

1 8. (Withdrawn) The method of claim 6, wherein said reducing conditions comprise a  
2 non-hydrogen containing atmosphere.

1 9. (Withdrawn) The method of claim 6, wherein said acceptor-doped material comprises  
2 a substrate, a n-type ZnO layer deposited on said substrate, and a p-type layer deposited  
3 on said n-type ZnO layer.

1 10. (Withdrawn) The method of claim 6, wherein said intermediate temperatures  
2 comprises a temperature range between 200 °C and 700 °C.

1 11. (Currently Amended) A wide band gap semiconductor device comprising:  
2 a substrate;  
3 an annealed n-type ZnO layer directly positioned on said substrate; and  
4 an annealed p-type ZnO layer directly positioned on said n-type ZnO layer, said  
5 annealed p-type ZnO comprises an acceptor doped material under reducing conditions,  
6 said annealed n-type ZnO layer and said annealed p-type ZnO layer has increased p-type  
7 conductivity by removing hydrogen interstitials or intrinsic donors to thereby activate  
8 impurity acceptors are annealed at intermediate temperatures under oxidizing conditions  
9 between approximately 200 °C and 700 °C to activate p-type conductivity.

1 12. (Previously Presented) The wide band gap semiconductor device of claim 11,  
2 wherein said acceptor-doped material is exposed to a hydrogen containing atmosphere.

1 13. (Previously Presented) The wide band gap semiconductor device of claim 11,  
2 wherein said acceptor-doped material is exposed to a non- hydrogen containing  
3 atmosphere.

1 14. (Cancelled).

1 15. (Cancelled).

1 16. (Currently Amended) A p-n junction comprising:

2 a substrate;

3 an annealed n-type ZnO layer directly positioned on said substrate; and

4 an annealed p-type ZnO layer directly positioned on said n-type ZnO layer, said  
5 annealed p-type ZnO comprises an acceptor doped material under reducing conditions,  
6 said annealed n-type ZnO layer and said annealed p-type ZnO layer has increased p-type  
7 conductivity by removing hydrogen interstitials or intrinsic donors to thereby activate  
8 impurity acceptors are annealed at intermediate temperatures under oxidizing conditions  
9 between approximately 200 °C and 700 °C to activate p-type conductivity.

1 17. (Previously Presented) The p-n junction of claim 16, said acceptor-doped material is  
2 exposed to a hydrogen containing atmosphere .

1 18. (Previously Presented) The p-n junction of claim 16, wherein said acceptor-doped  
2 material is exposed to a non- hydrogen containing atmosphere .

1 19. (Cancelled)

1 20. (Cancelled)